

Tropical GRIP Forecast Discussion for September 8, 2010

Created 1600 UTC September 8, 2010

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Summary: Today is a no-fly day for all GRIP aircraft. The earliest the Global Hawk could fly a test flight with the dropsondes would be the middle of next week. The WB57 is hoping to have its canopy issue resolved in the next 2 days. After a successful deployment to St Croix to catch the remnant low that was Gaston, the DC-8 returned to FLL last night. The non-developing case of Gaston will prove interesting compared to the life cycle of Hurricane Earl that was studied by the aircraft last week. Elsewhere, the low formerly called Hermine continues to inundate Texas with rain, and PGI-39L is making its way west with some convection and a low level circulation. PGI-41L underwent cyclogenesis quickly this morning, and the NHC designated it as having a low chance of formation in the next 48 hours early this morning, then updated to 70% at 8am, and by 11am it is now Tropical Storm Igor. Additionally, PGI-42L is just exiting the coast of West Africa and PGI-43L is well behind it, still over the African continent.

Forecast for 1600 UTC 9/08/2010:

Synoptic Overview:

The tropical Atlantic is fairly active today, especially close to Africa (**S1**). However in the western half of the basin, the remnant low of Hermine and Ex-Gaston are the main surface features of interest. Hermine is no longer of interest to GRIP, but it has brought flooding to Texas and is making a slow transit over land heading toward the Midwest US today. The Gulf of Mexico is actually mostly void of convection today (**S2**), except near southern FL and western Cuba associated with a surface shortwave trough (**S1, C4**). The Gulf is fairly moist, as shown in TPW and water vapor imagery (**S4, S6**), except at mid- levels near Louisiana. At upper levels, the Gulf is dominated by strong, 20- 30 kt northerly and northeasterly wind shear (**C2**). This is associated with the upper level trough oriented NE to SW across the GOM (**C1, C3**). There is an upper level low over Cuba and extending south, ahead of Gaston, whose vorticity with height shows its separation from the cold low is only a few degrees longitude (**C3**). Aside from convection associated with Ex-Gaston, the rest of the Caribbean is fairly quiet with mainly only scattered cumulus convection (**S3**).

The Subtropical High is dominating the lower levels of the central North Atlantic all the way south to about 25N (**S1**). There is substantial dry air (**S4**) present between the Windward Islands (60W) and PGI-39L (40W), however this area is a low shear zone (**C2**). Further east, PGI-39L is located at approximately 19N/36W, has good lower level vorticity (**C6**) and is embedded in a moisture maximum through the troposphere (**S4, S6**), as shown by TPW and water vapor imagery. PGI-39L has dust wrapping around it (**S5**), and only light convection associated with it at this time (**S2**).

Closer to Africa, TS Igor/PGI-41L is convectively active (**S7**) and has moisture being imported into the system at low levels from southeasterly winds associated with the ITCZ (**C7**). Also at low levels, there is a broad, strong Azores High keeping the track of

most of the waves further south on a westward heading. The well-developed low level vorticity associated with Igor can be seen in the CIMSS 850 hPa vorticity plot (C6), as well as indicating the location of PGI-39L off to its NW. Wind shear near Igor is fairly low (C8), and upper level easterlies dominate the flow (C5) above PGI-41L, -42L, and -43L, with a mid-level steering (C9) being easterly or southeasterly over Africa and exiting the continent, except in the immediate vicinity of Igor. Wind shear near PGI-39L is unfavorable (C8), and continues to be an inhibiting factor to development.

Features of Interest:

Ex-Gaston/PGI-38L:

The remnants of Gaston, located a couple hundred miles southeast of the Dominican Republic at 1200 UTC, are producing disorganized showers and thunderstorms. The NHC has ex-Gaston at a nearly 0% chance of redeveloping in the next 48 hours as the convection moves westward at 10 to 15 mph. Over the last 24 hours, bursts of convection have been observed, but no long lasting, organized convection has, or is expected, to develop. The remnants of ex-Gaston will continue to move westward during the next couple of days, remaining over warm 29-30 SSTs and increasing ocean heat content (G1, G2). GOES-5 aerosol imagery show dust mass in the upper levels around ex-Gaston but become less prevalent at lower levels (D2, D3), and this was not necessarily observed by either the DC-8 or the PREDICT GV. Most of the 1200 UTC global models agree that ex-Gaston is not likely to redevelop as it progresses westward further into the Caribbean Sea (G5), however the ECMWF ensemble does indeed tend to develop this system again, and is much more aggressive in doing so than any other models.

PGI-39L/AL99:

PGI39/AL99 as of 1200 UTC is located at 20N and 35W with similar low convective activity to yesterday (39A). Water vapor (S6) and dry air analyses (D1) show a hostile environment around the system, with some dry air possibly making it into the pouch. The system is forecasted to have decreasing vorticity and OW (39C) values with increasing shear values (39D) within the next 24 hours. The GFS forecasts that the system is not likely to stay an area of interest past 24 hours while the ECMWF diminishes the system in the next 48 hours. PGI-39L continues to be an unlikely target for GRIP due to its location and forecasted weakening.

PGI-41L/Tropical Storm Igor and PGI-42L:

PGI-41L has been upgraded to TS Igor during the progression of this very discussion. Igor's position as of the 1500 UTC advisory is 13.7N, 23.5W. Substantial low-level vorticity has been analyzed (I1), and the circulation center is apparent in visible imagery as well as the most recent scatterometer pass (I2). The convection, although deep, has been displaced to the west of the center (I1). This is indicative of strong easterly shear, which has been analyzed at 29 kt by the 1200 UTC SHIPS model. Although some drier air is located well to the west, there is ample moisture within the pouch itself, with TPW values exceeding 55 mm (I3). Igor appears to be enhanced by a Kelvin wave that is passing through the far Eastern Atlantic (I4), both through the

enhanced convection and by the low-level westerly wind anomalies generating cyclonic vorticity on its north side.

PGI-42L was analyzed at 0000 UTC near the coast of southwestern Senegal at approximately 14N, 16W, but based on latest satellite imagery it has generated an MCS and has moved off the coast. It appears that Igor, being the stronger of the two systems, will absorb PGI-42L over the next couple days. The GFS and ECMWF strongly agree on the intensification of Igor as it moves generally westward (**I5, I6**), and the statistical (SHIPS) and dynamical (GFDL, HWRF) intensity models indicate substantial intensification as well (**I7**). Although the easterly shear is currently strong, this is projected by the SHIPS to gradually diminish. Sea surface temperatures are around 28C, and are expected to remain near that value over the track during the next 5 days. The official NHC intensity forecast calls for 65 kt in 72 hours, and 85 kt in 120 hours.

Over the next 5 days, the track is projected to be generally towards the west-northwest (**I7**), although there is uncertainty regarding the speed. Igor may present a viable GRIP target in about a week, should it follow model consensus and continue towards the WNW beyond the 5-day time frame, although uncertainty in the long-range track is very high.

PGI-43L:

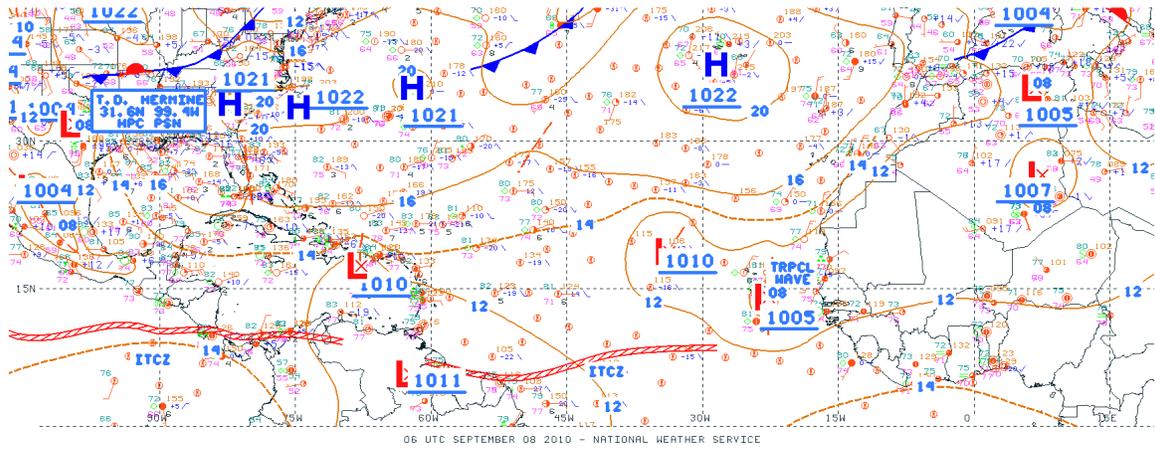
Although still well inland over Africa, this feature is of some interest because almost all models, including the GFS (**I5**) and ECMWF (**I6**), develop this into a tropical cyclone in as little as 4-5 days near the Cape Verde Islands. This system will continue to be monitored closely.

Dust/SAL Discussion:

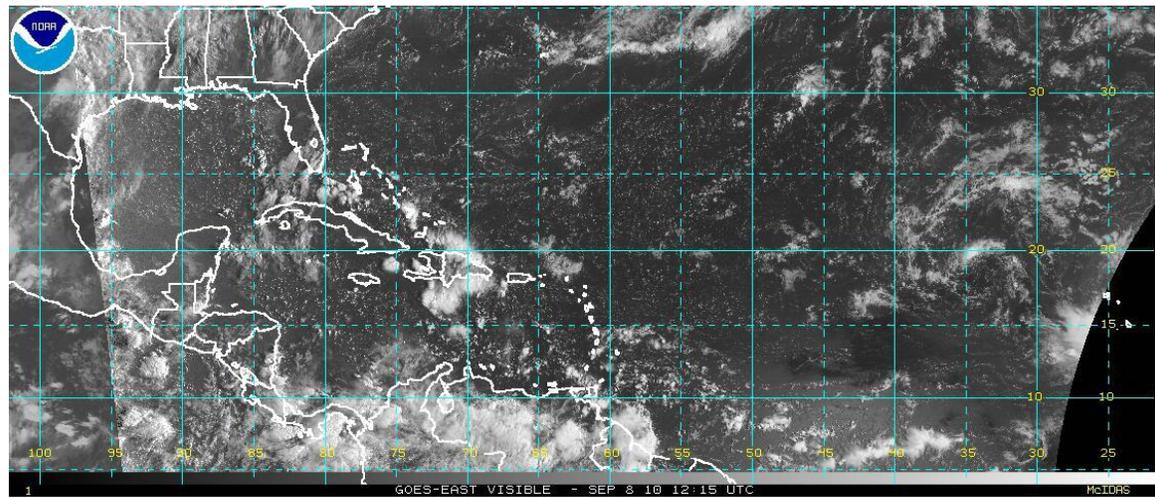
Dry air continues to interact with PGI39L, PGI41L and PGI42L as the systems progress westward (**D1**). Water vapor imagery reinforces the location of the dry air as it surrounds the invests off of the African west coast (**S6**). The largest concentrations of dry air appear to be at upper levels across the Atlantic into the Caribbean and at lower levels off the western coast of Africa (**D2, D3**). Dust concentrations are moderate at upper levels along the western side of ex-Gaston. Throughout all of the areas of interest, we observe aerosol optical depth decreasing at 500-hPa and considerably by 700-hPa. The forecast for dust concentrations across the Atlantic shows that much of the Atlantic will have continuing dust at 200-hPa. A moderate plume of dust has emerged off the western coast of Africa at lower levels (700hPa) (**D5**), but a more considerable plume of dust will be emerging off of the African coast in about 48 hours in lower levels (**D3**).

Images used in discussion:

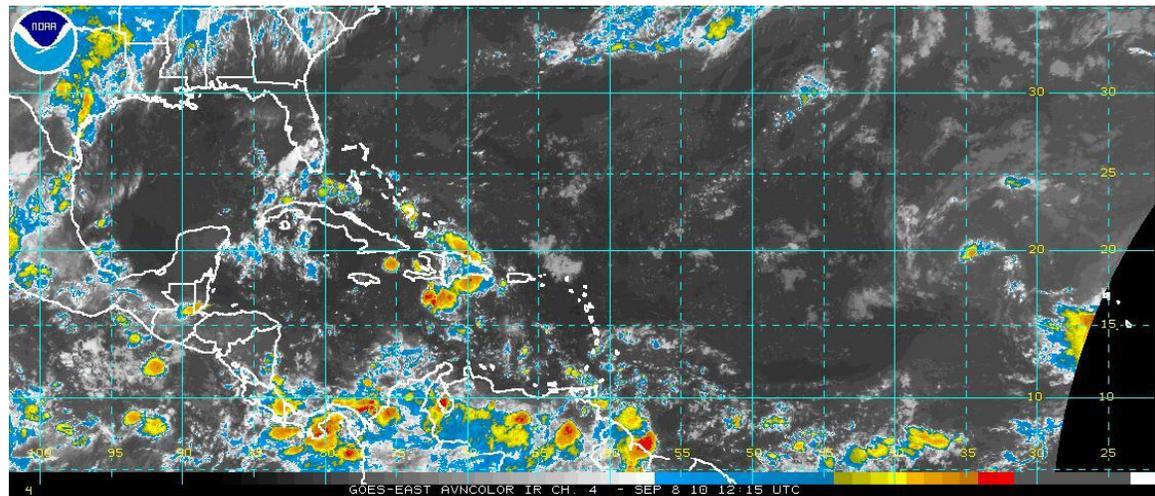
S1



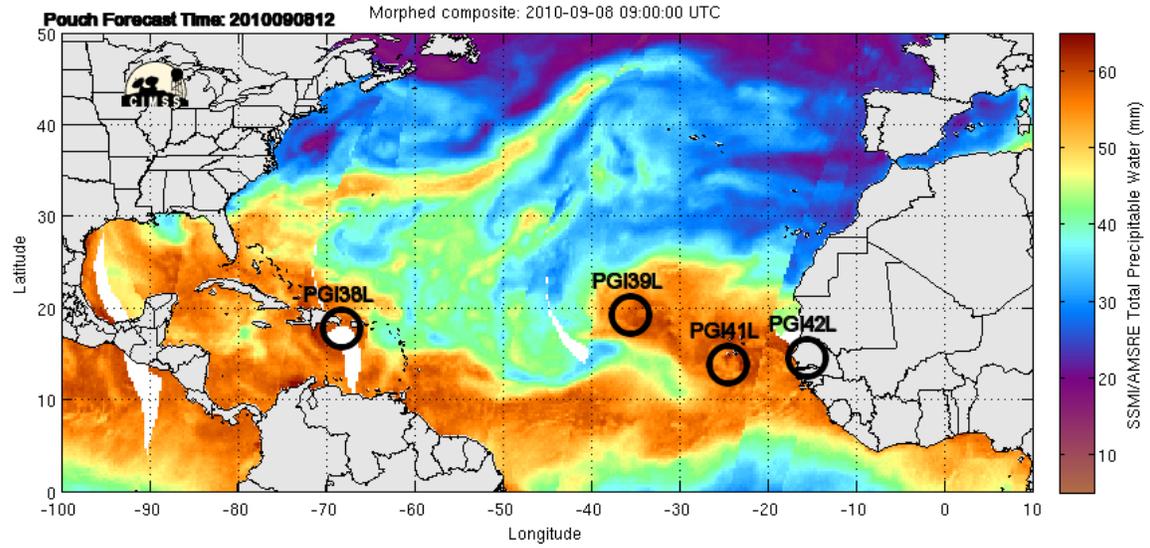
S2



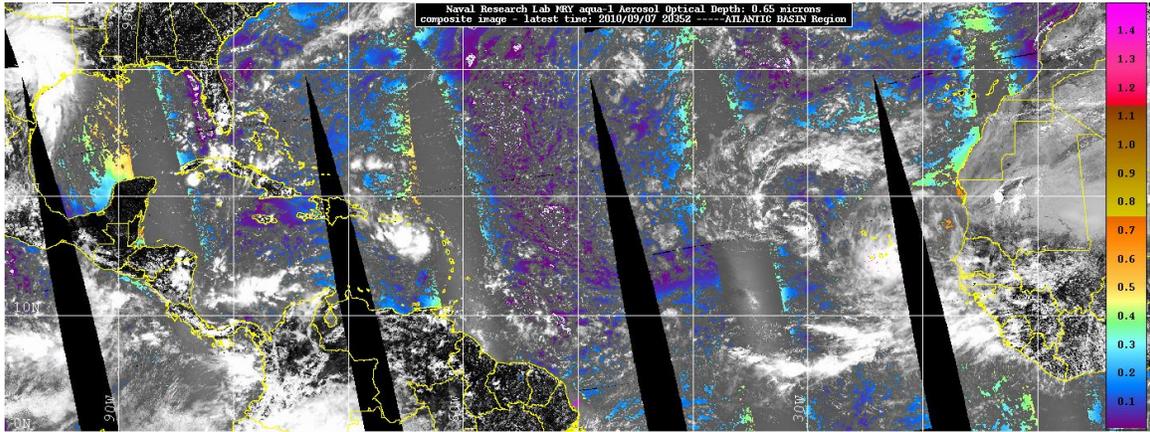
S3



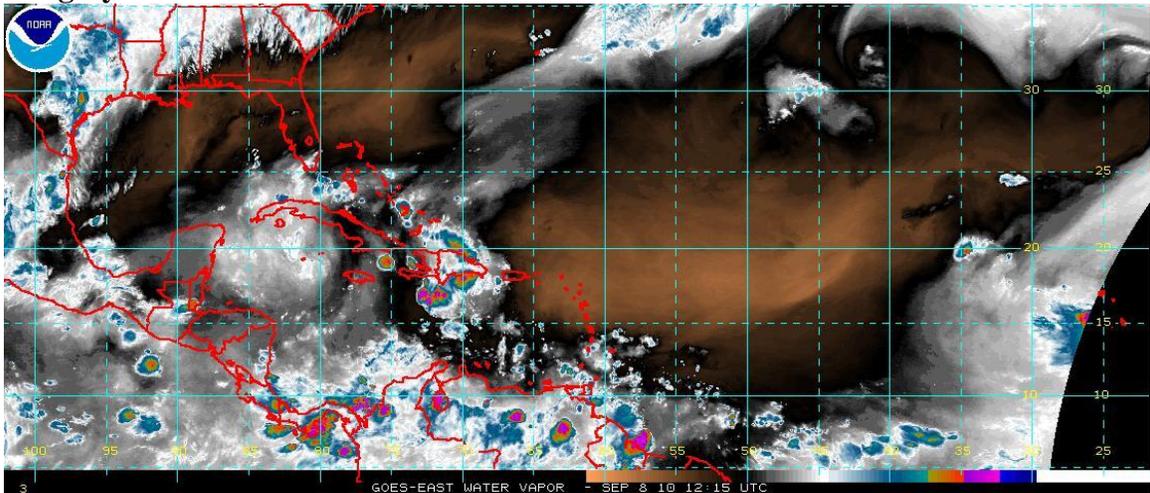
S4



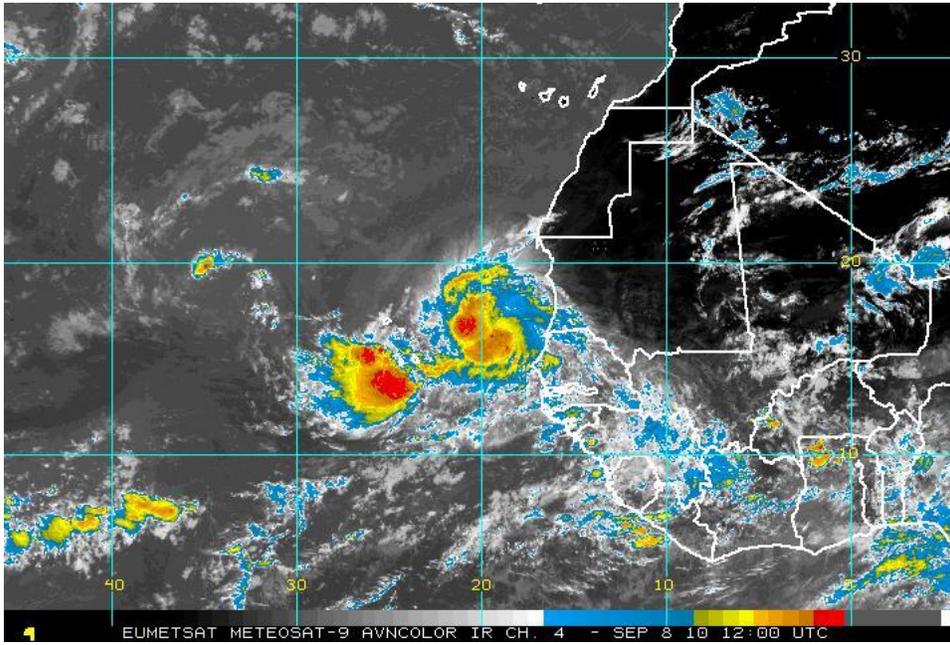
S5 AOT from NRL



S6 Water Vapor
Imagery

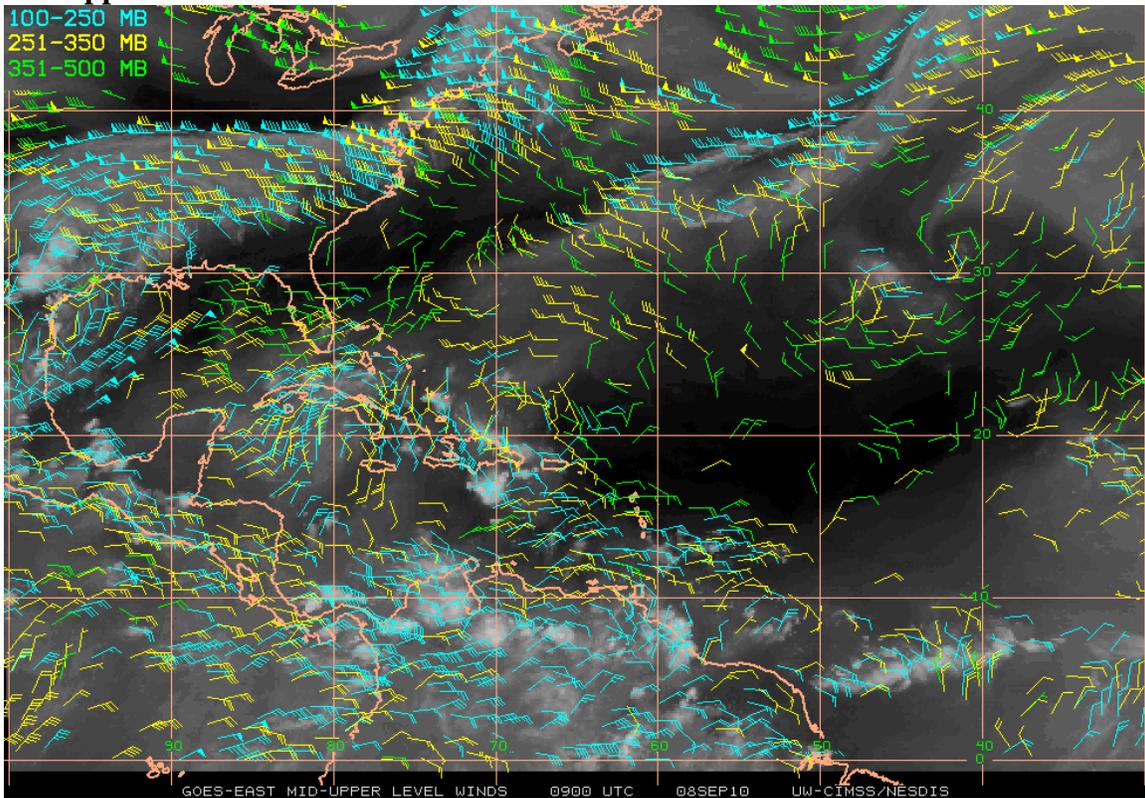


S7

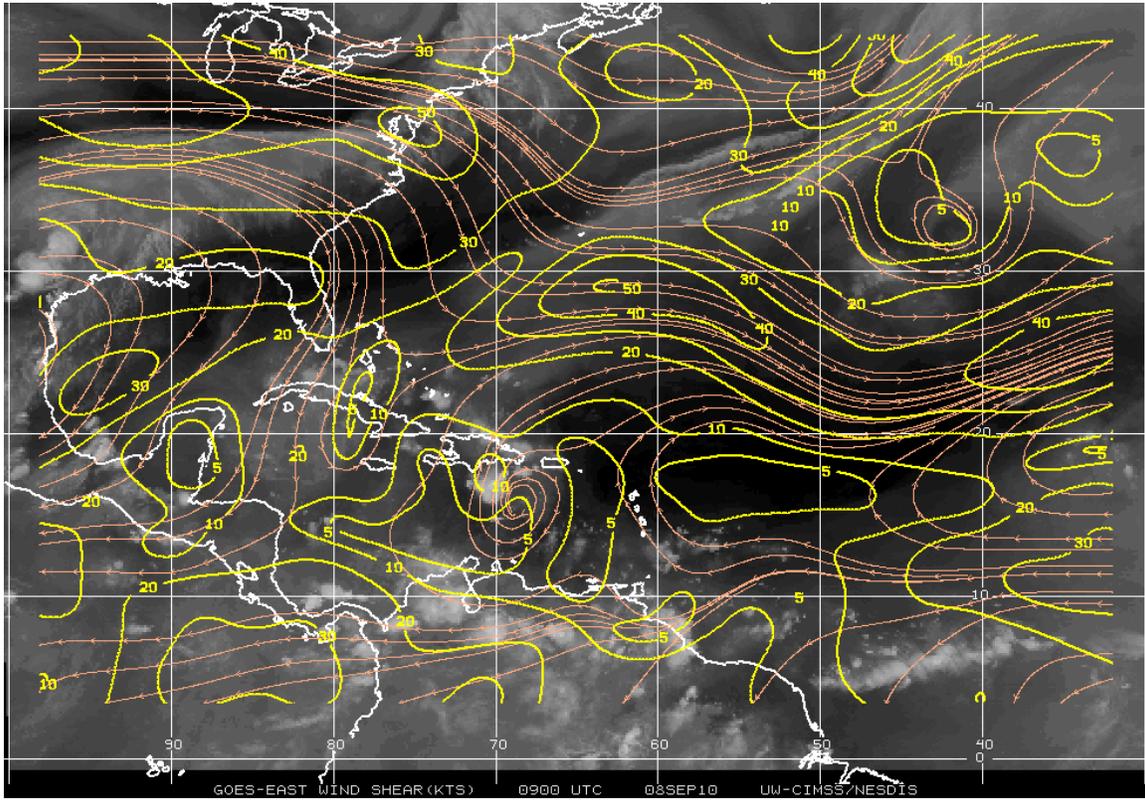


CIMSS Analyses:

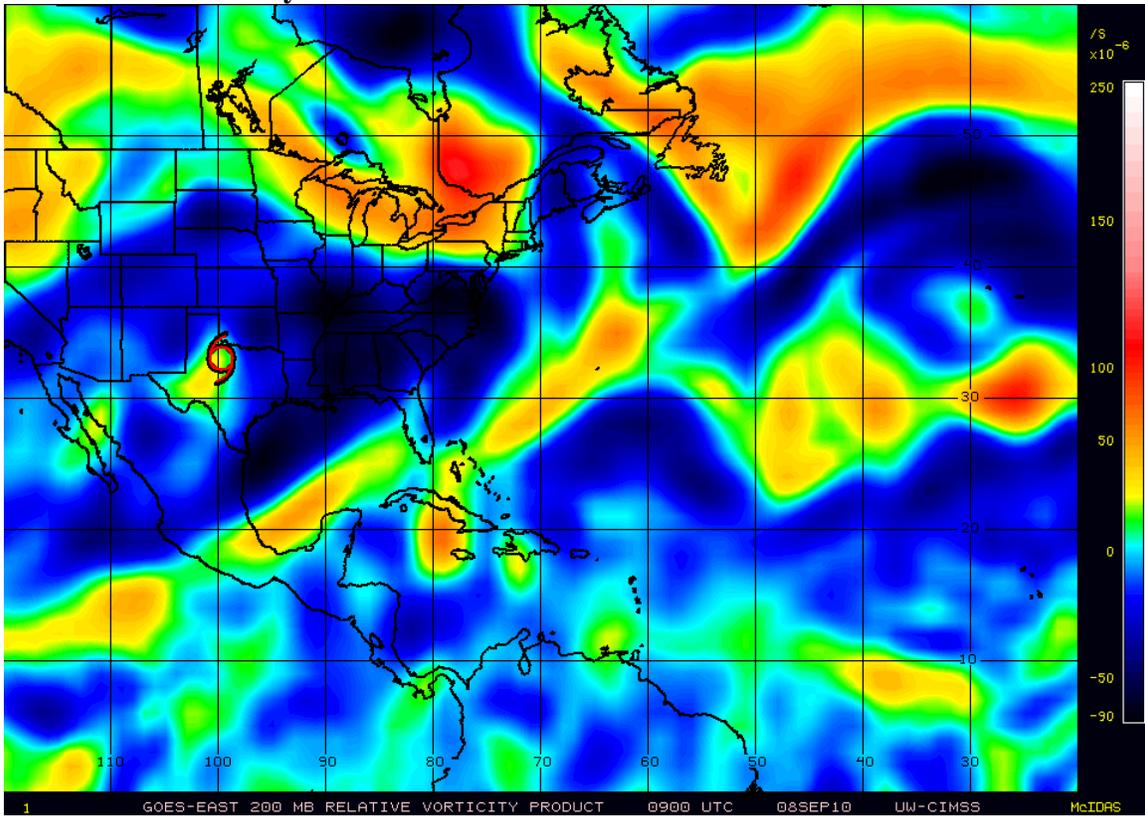
C1- Upper Level Winds



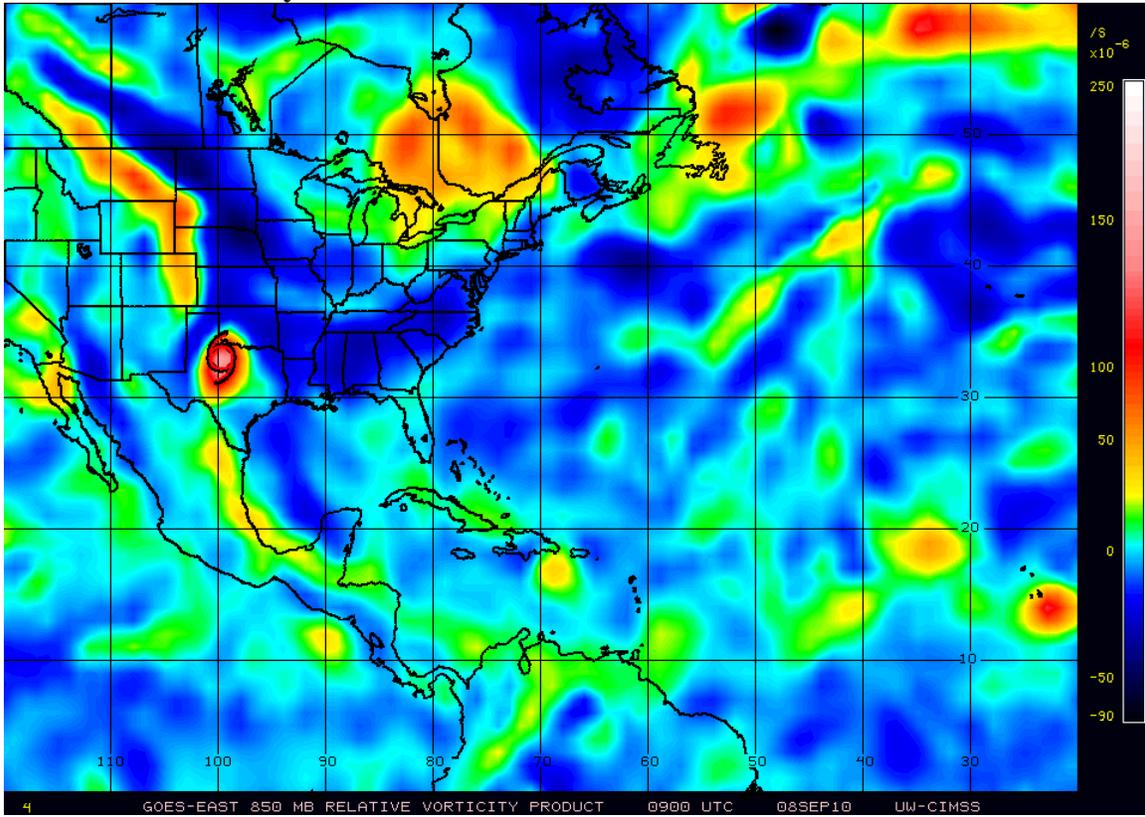
C2- Wind Shear



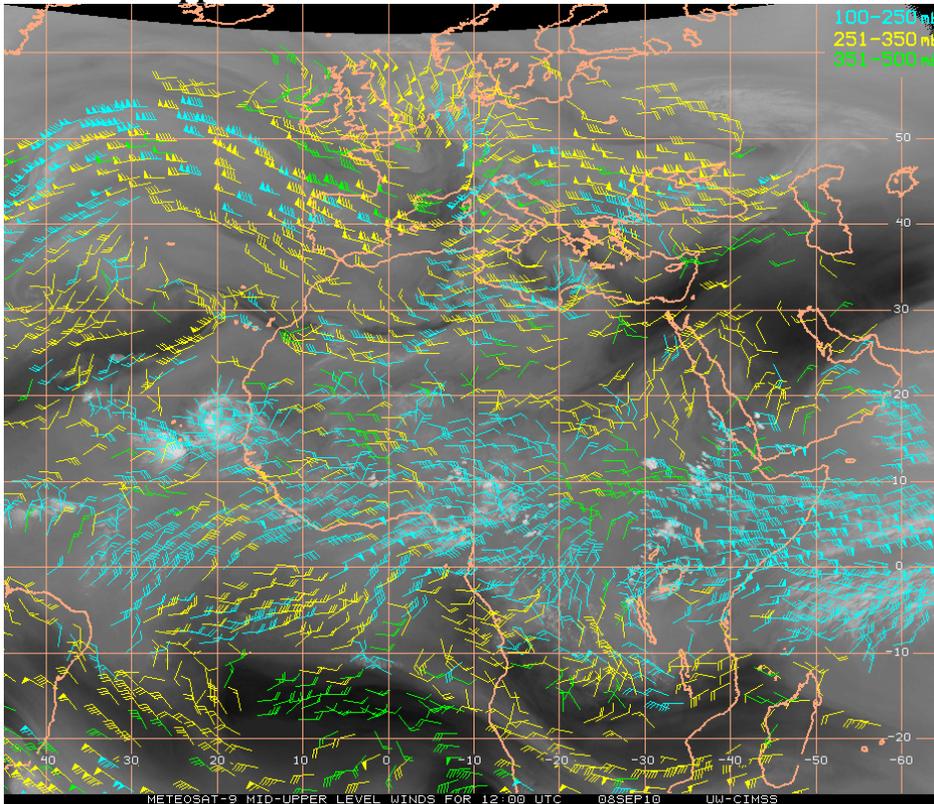
C3- 200 hPa Vorticity



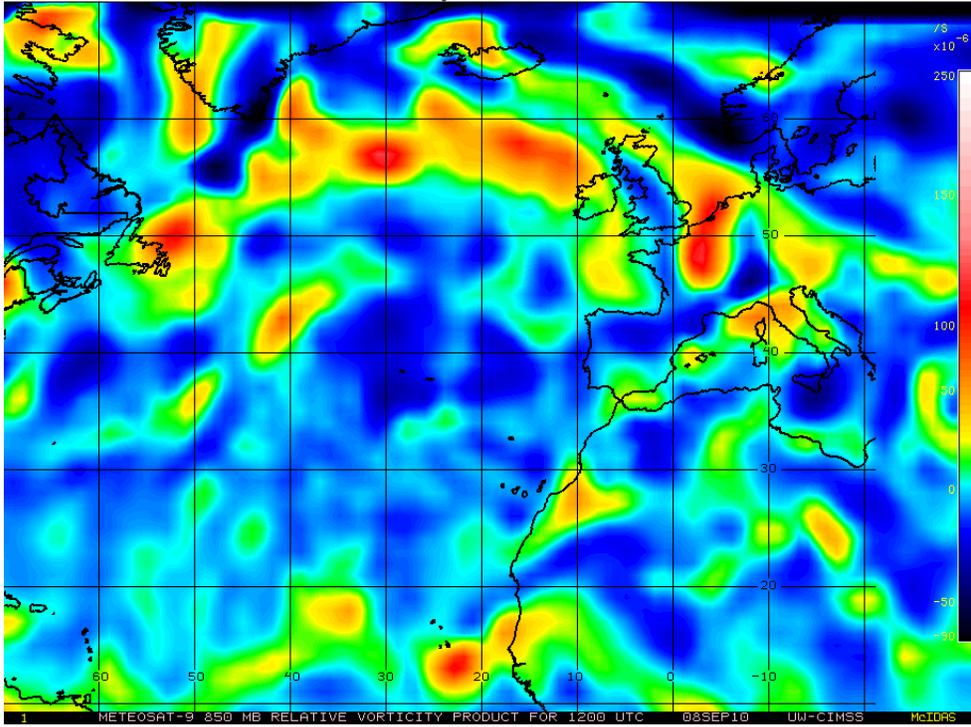
C4- 850 hPa Vorticity



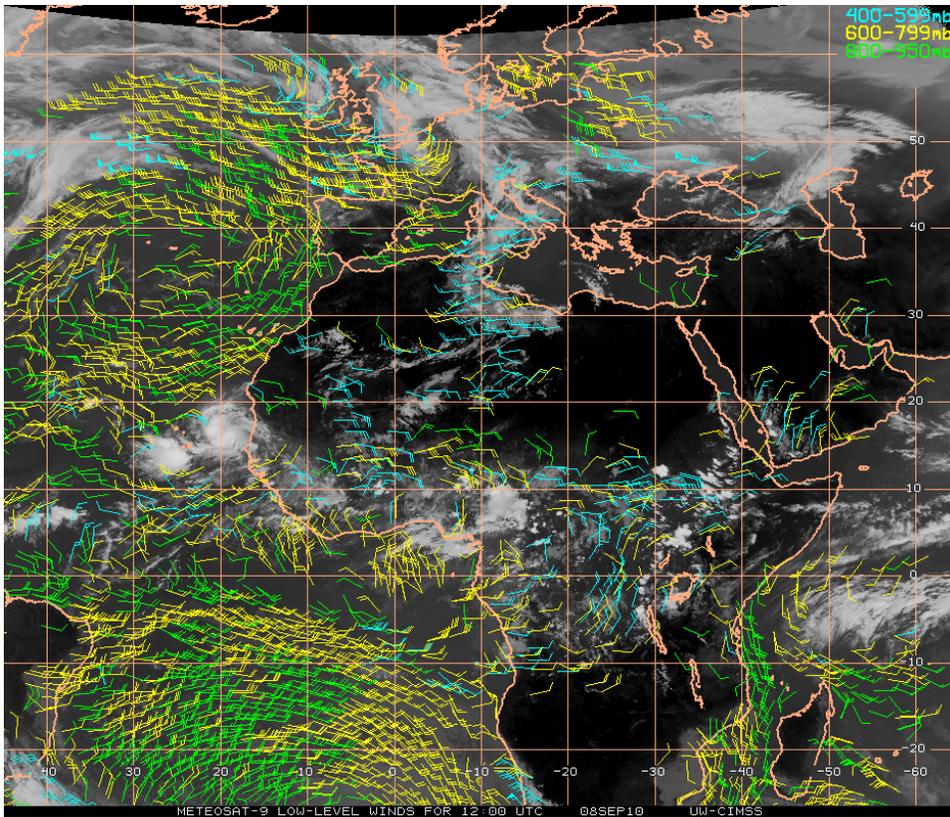
C5- Africa Upper Level Winds:



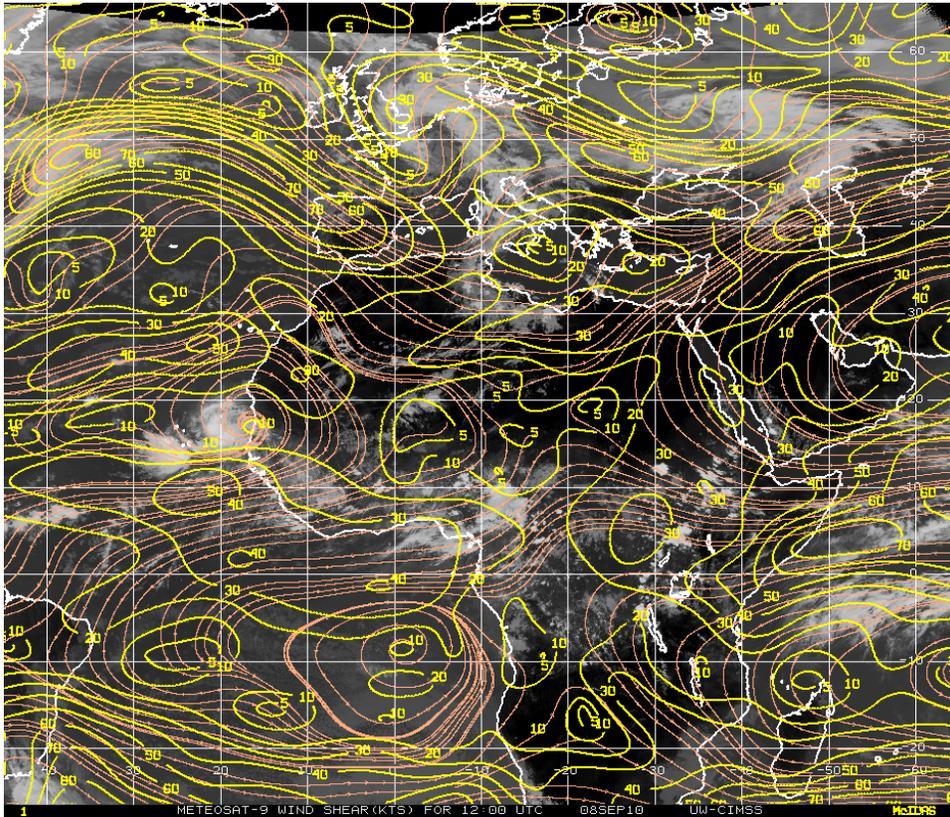
C6- Africa Lower Level Vorticity:



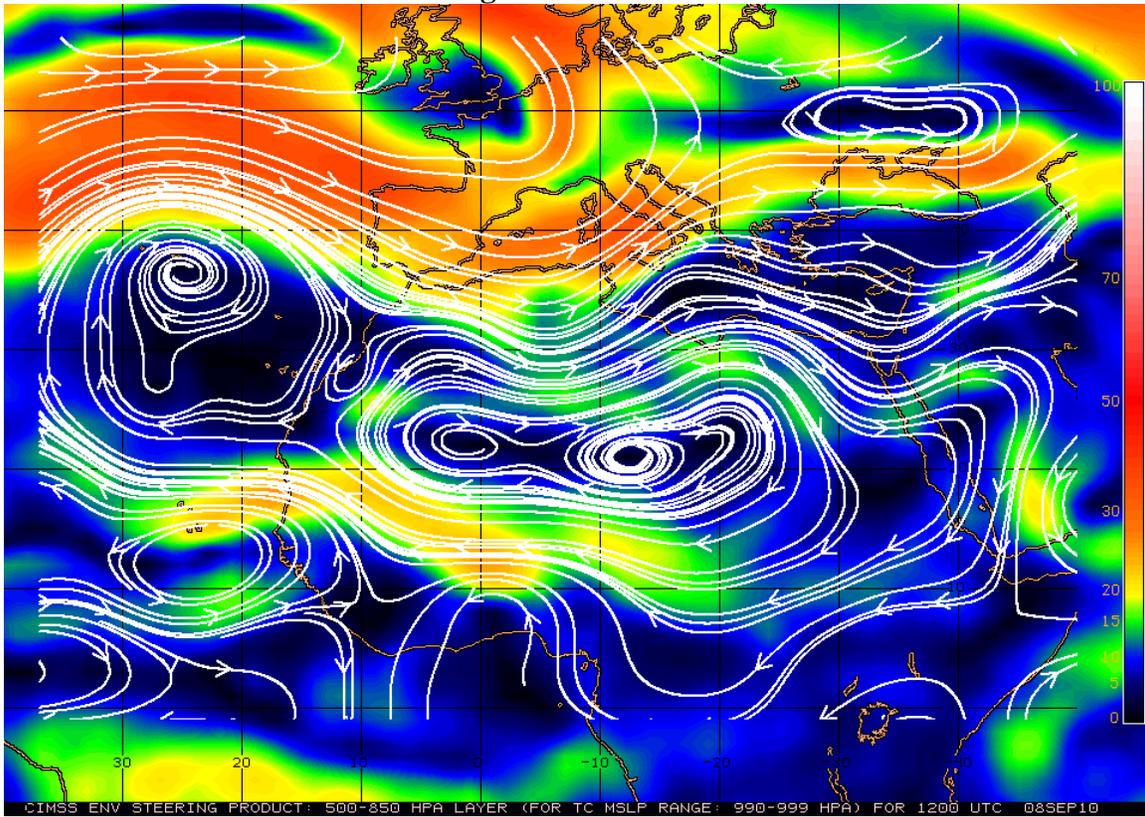
C7- Lower level winds over Africa:



C8- Wind Shear over West Africa:



C9- CIMSS Environmental Steering over West Africa for 500-850 hPa:

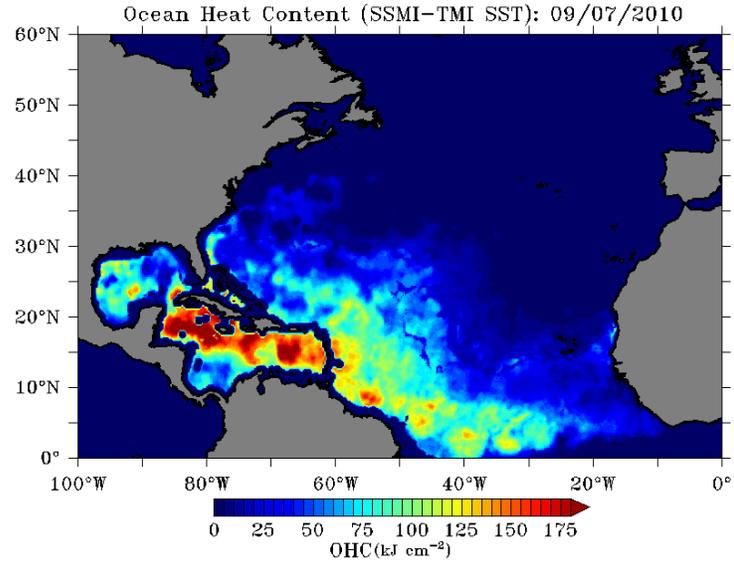
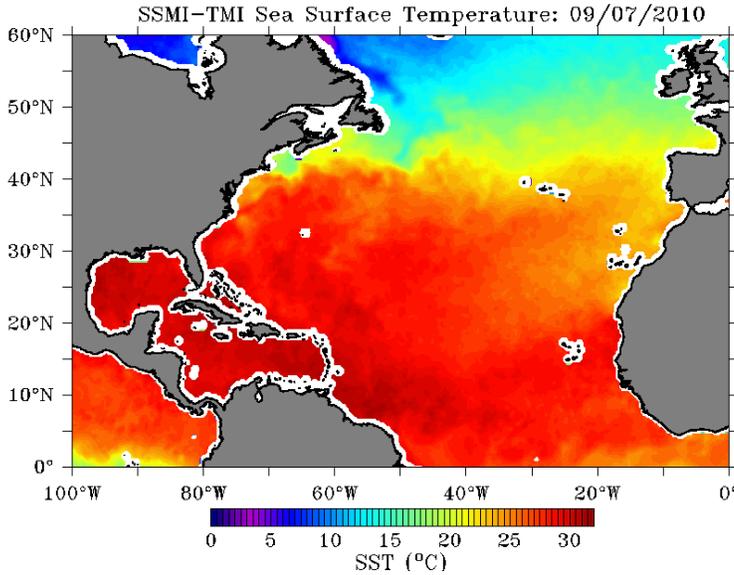


Features of Interest:

Ex-Gaston/PGI-38L:

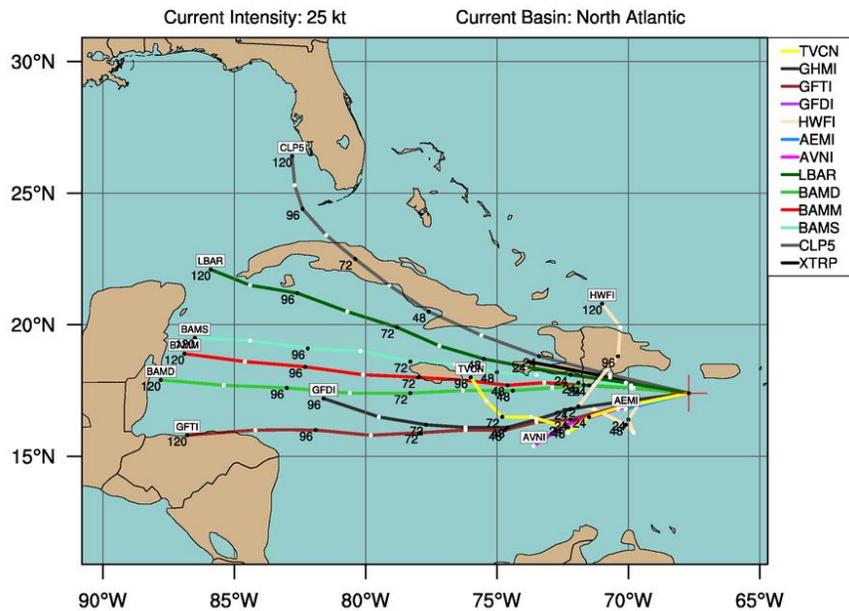
G1: SST's for the Atlantic ocean

G2: Ocean heat content over the Atlantic



LOW GASTON (AL09)

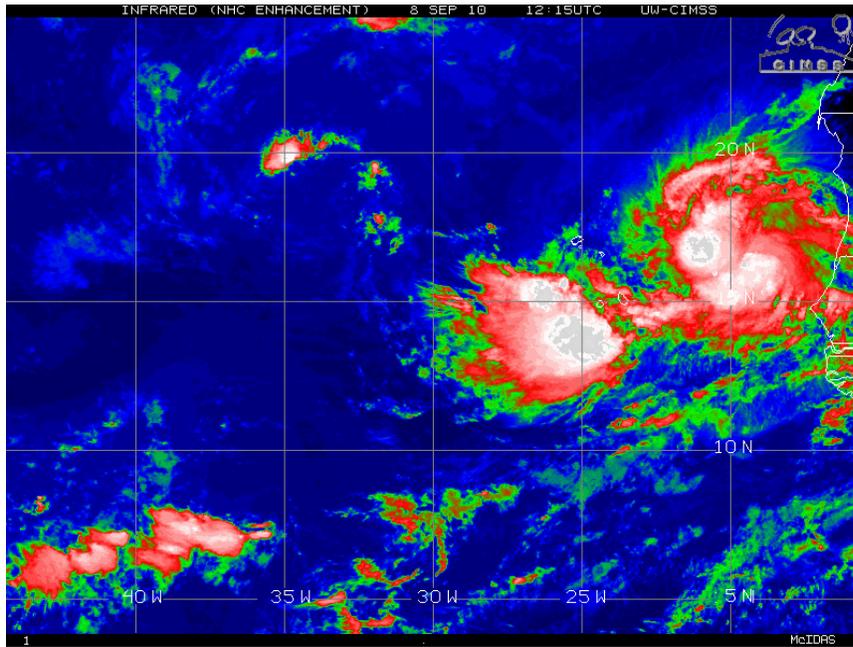
Early-cycle track guidance valid 0600 UTC, 08 September 2010



G5: Model Track Guidance

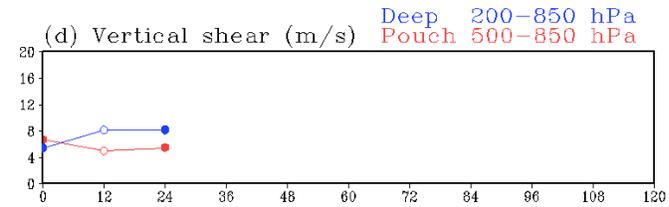
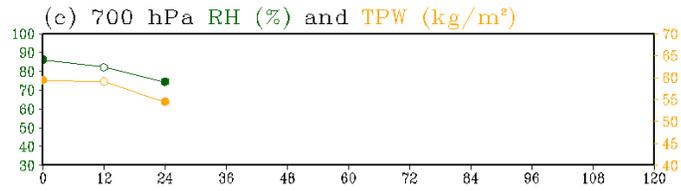
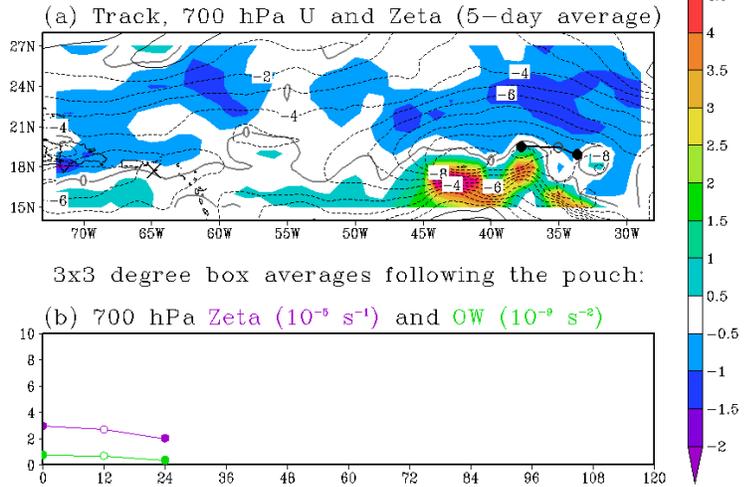
PGI-39L:
39A

39A: IR enhanced imagery including PGI39, PGI41 and PGI42

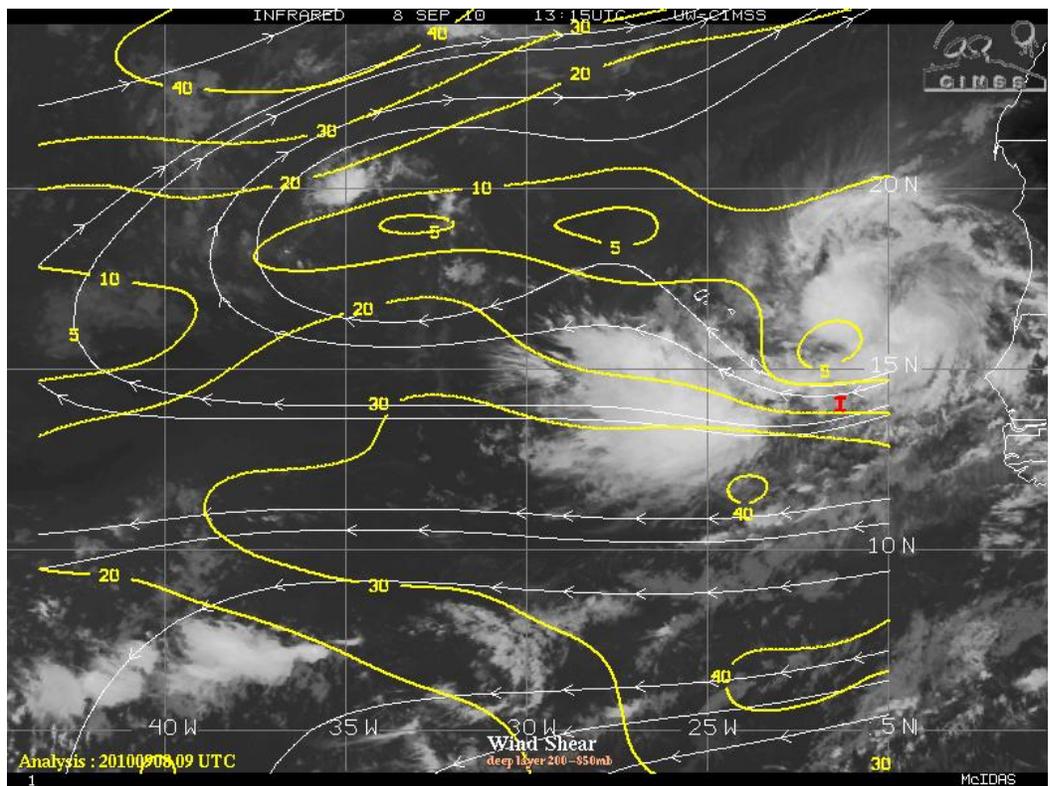


39C

PGI39L: 5-Day Forecast Based on GFS
 Initialized at 2010090800

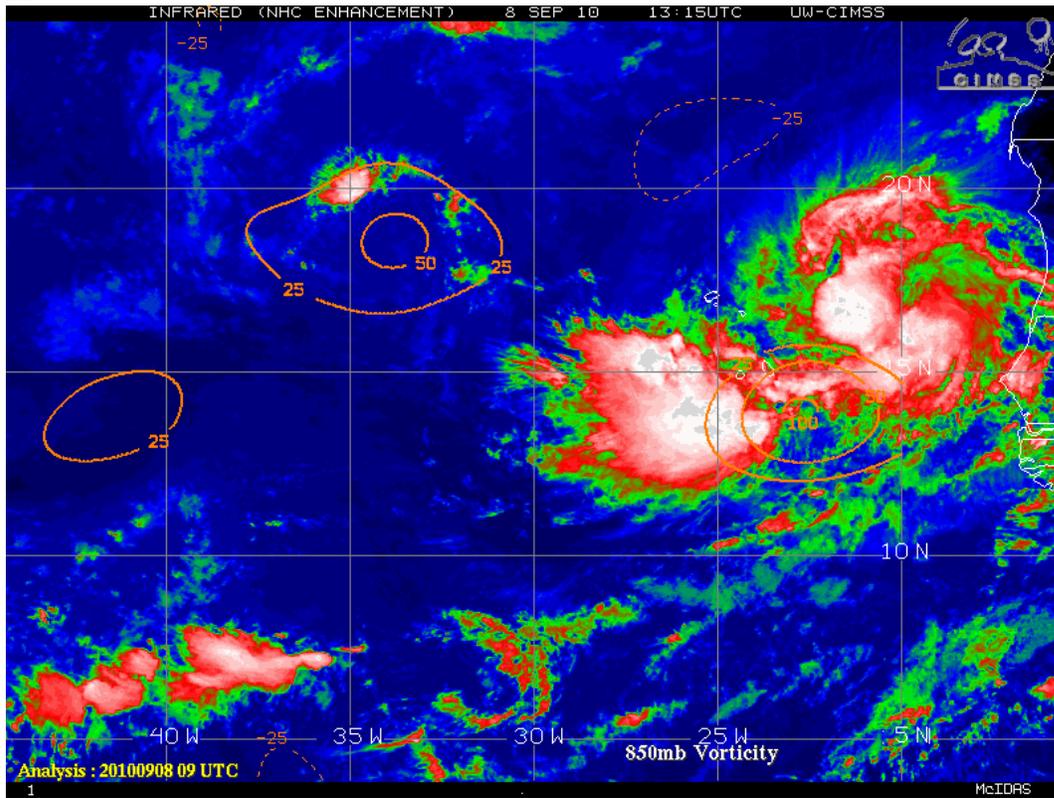


39D

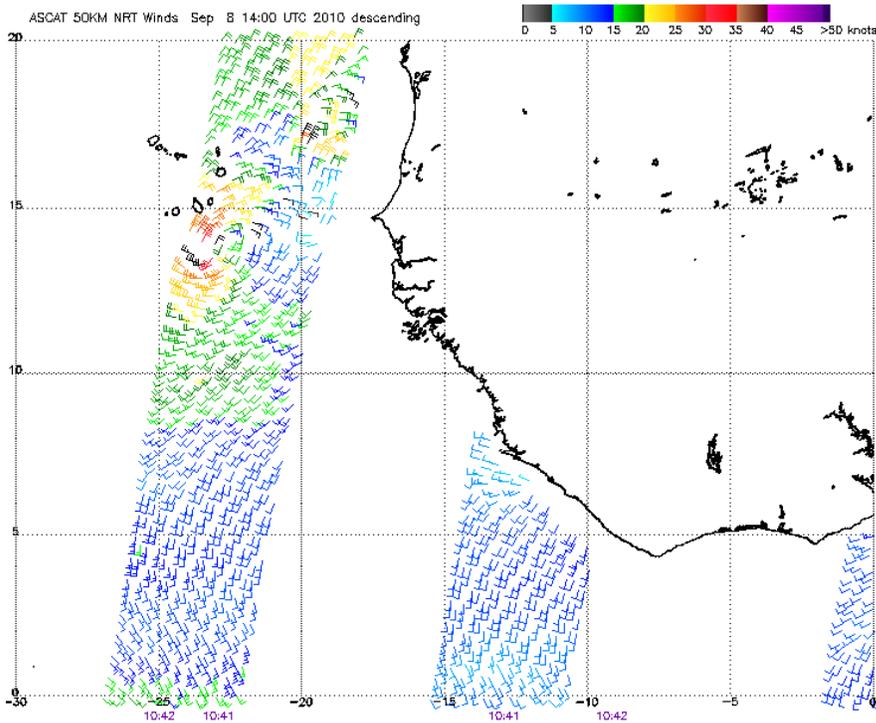


Tropical Storm Igor/PGI-41L:

I1:

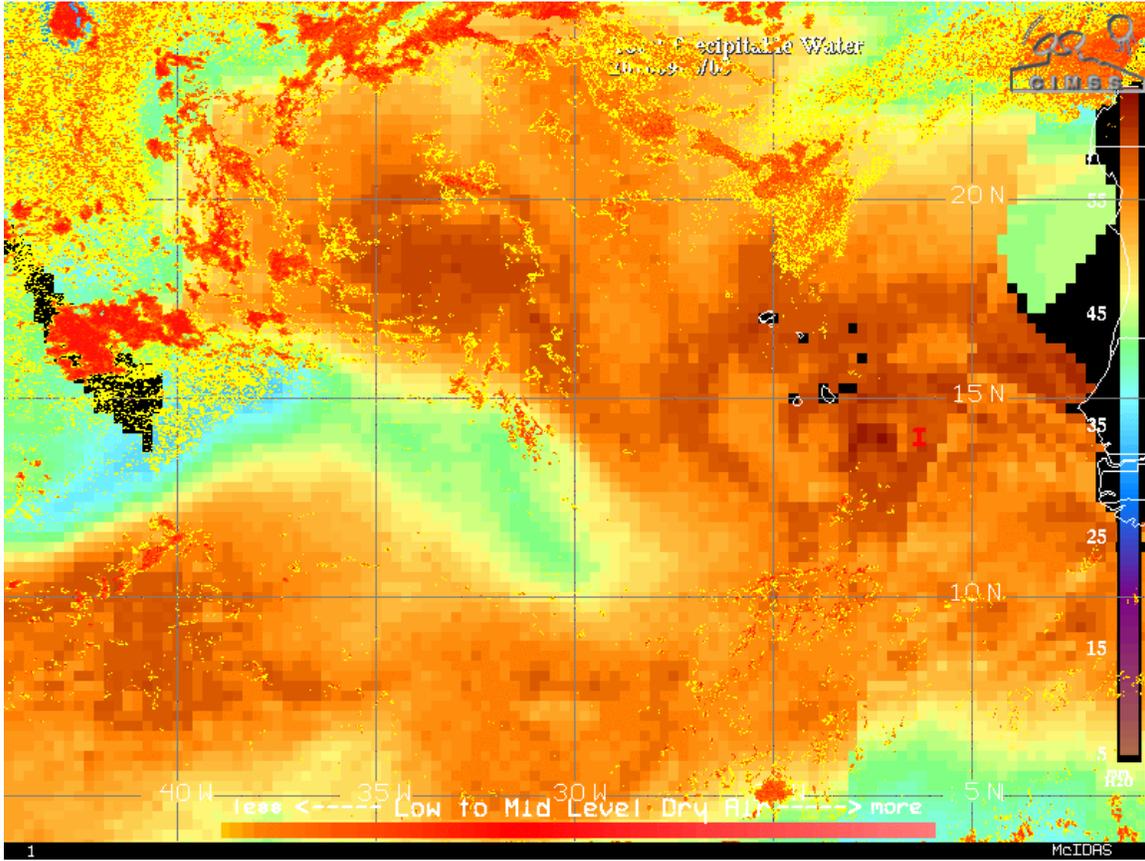


I2:

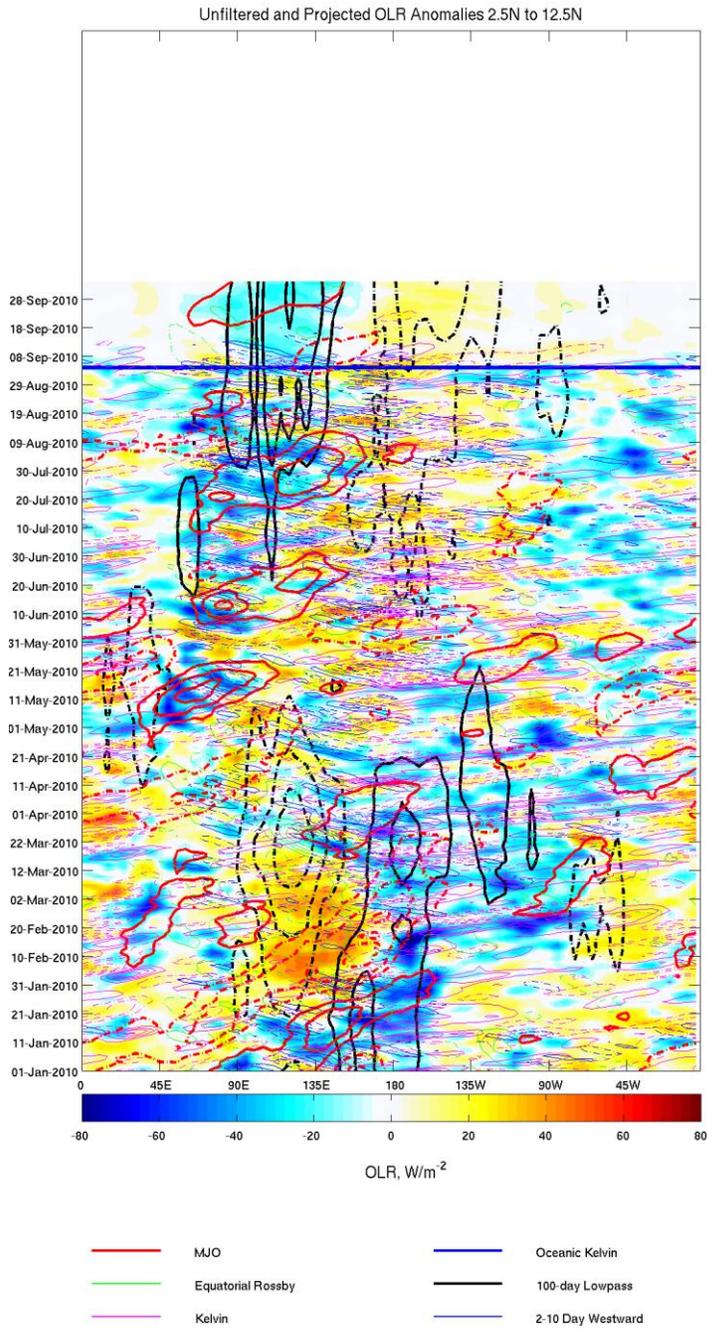


Note: 1) Times are GMT 2) Times along bottom correspond to measurement at 10N
 3) Data buffer is 22 hrs from Sep 8 14:00 UTC 2010 4) Black circles indicate possible contamination
 NOAA/NESDIS/Office of Research and Applications

I3:



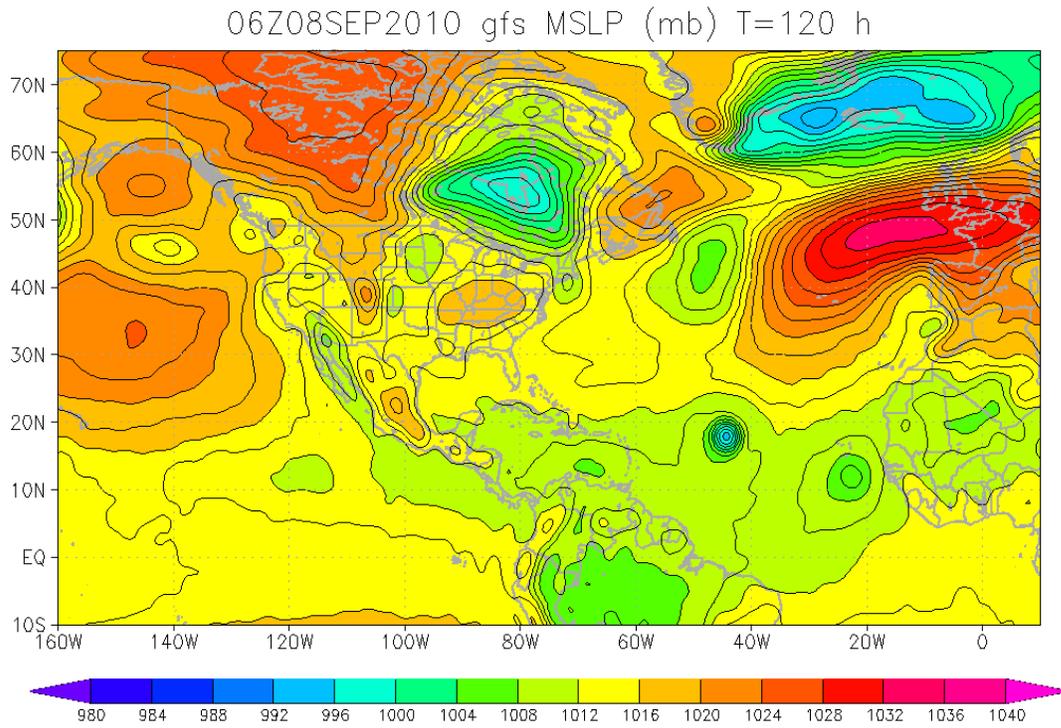
I4:



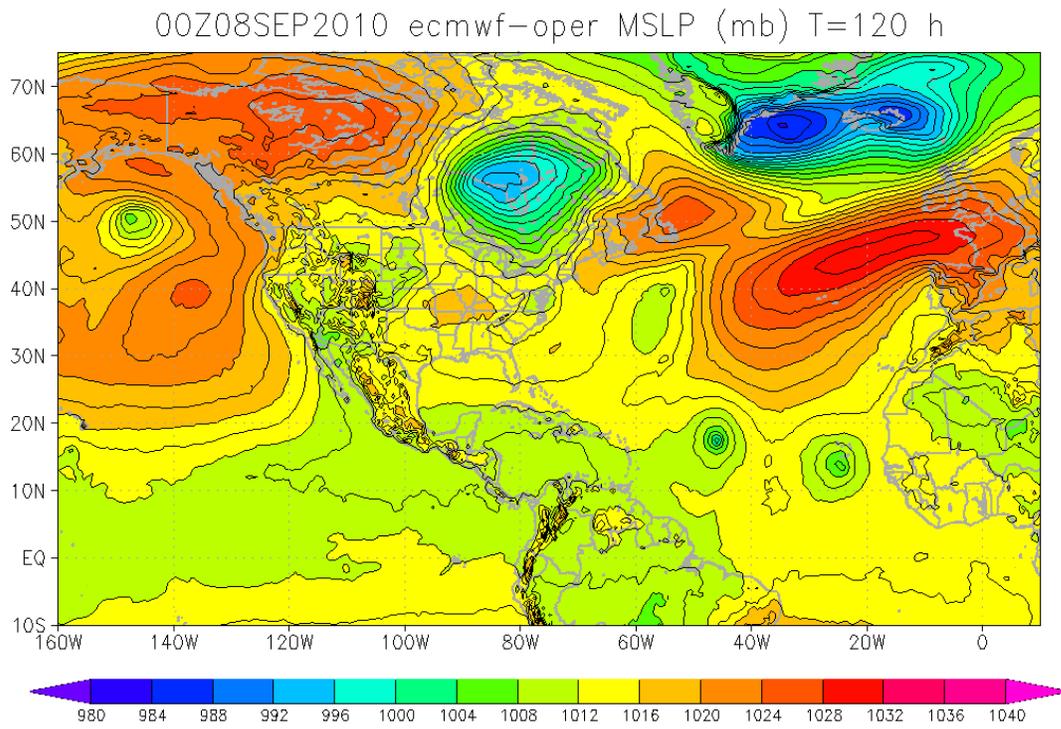
Shading represents OLR anomalies (i.e., the seasonal cycle and its first 3 harmonics have been subtracted). Heavy blue contours represent 10-120 day band dynamic height on the equator from the TAO buoy array (with missing values reconstructed from sea level gauge data). Other contours represent OLR anomalies projected onto a modified version of the time extended EOF modes of Roundy and Schreck (2009, QJRM). Equatorial dynamic height anomalies are plotted only on the diagrams for the 7.5N to 7.5S band, and are not yet available in real time.

Prepared by Paul Roundy, University at Albany.

I5:



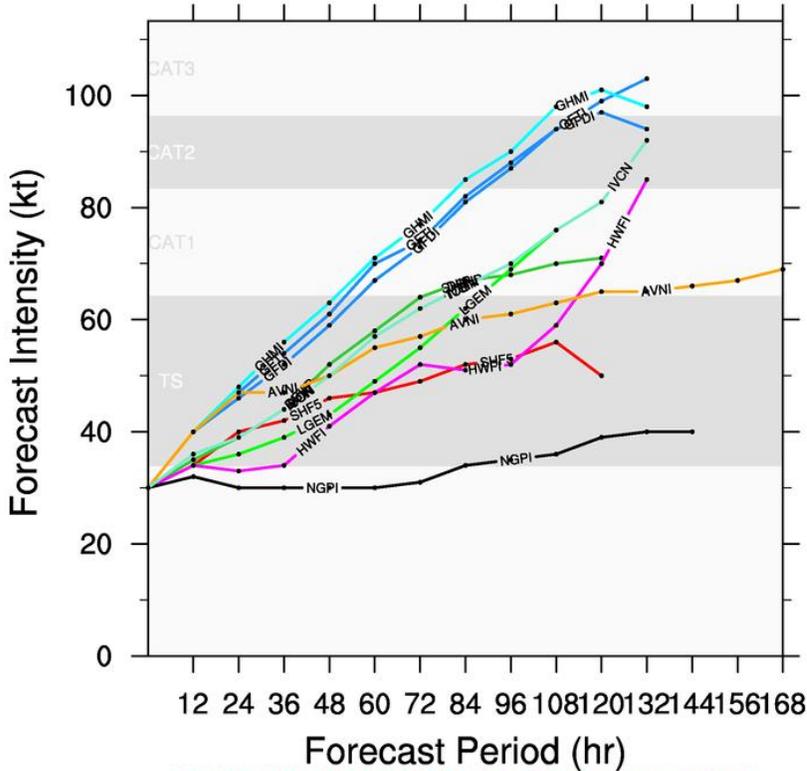
I6:



I7:

DISTURBANCE INVEST (AL91)

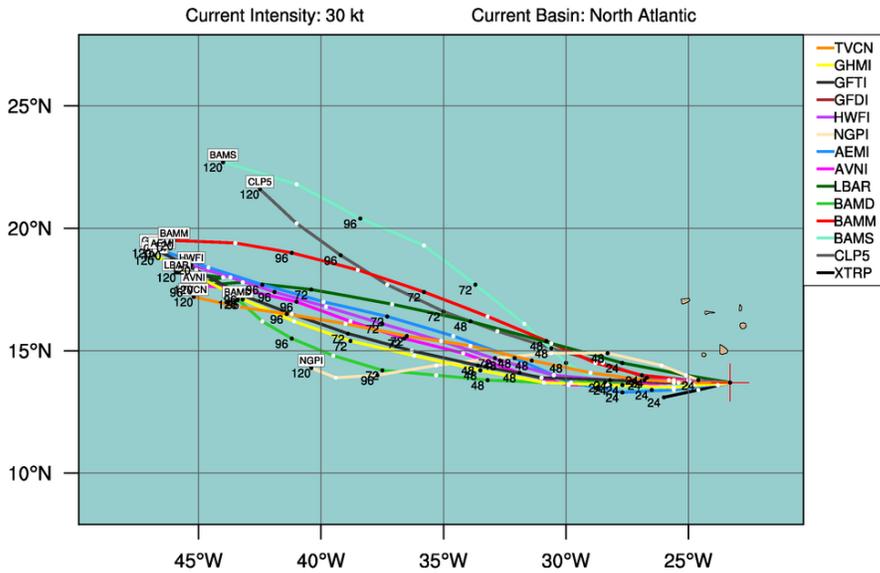
Early-cycle intensity guidance
valid 1200 UTC, 08 September 2010



This plot does not display official storm information. Use for information purposes only.
DO NOT USE FOR LIFE AND DEATH DECISIONS!

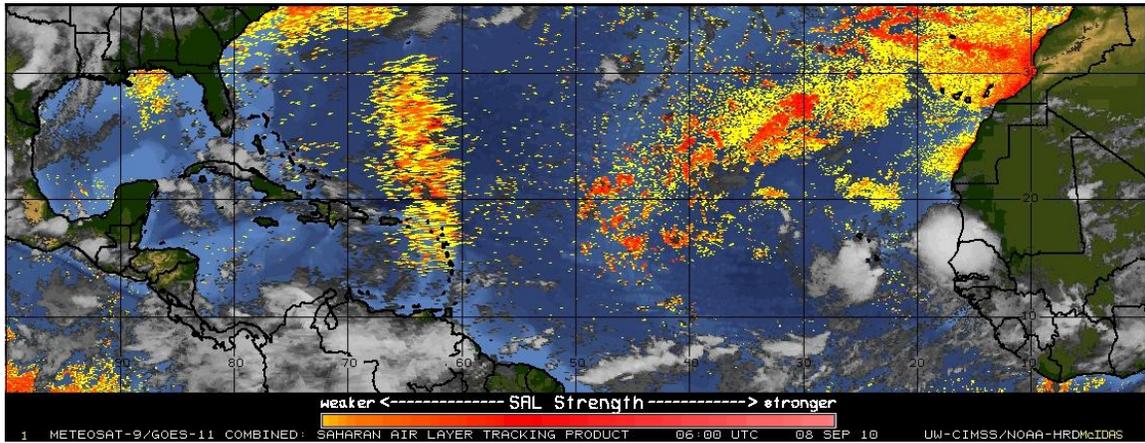
DISTURBANCE INVEST (AL91)

Early-cycle track guidance valid 1200 UTC, 08 September 2010

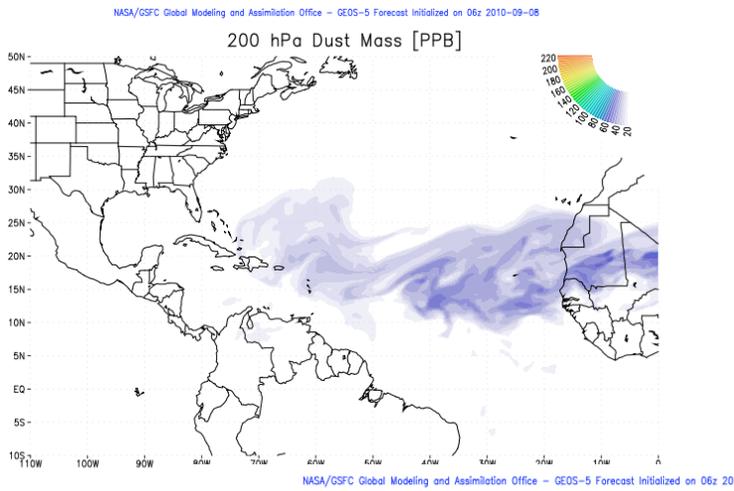


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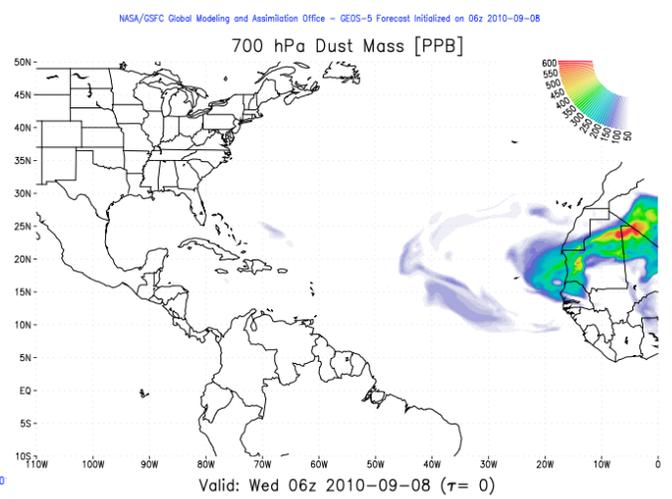
Dust:
D1



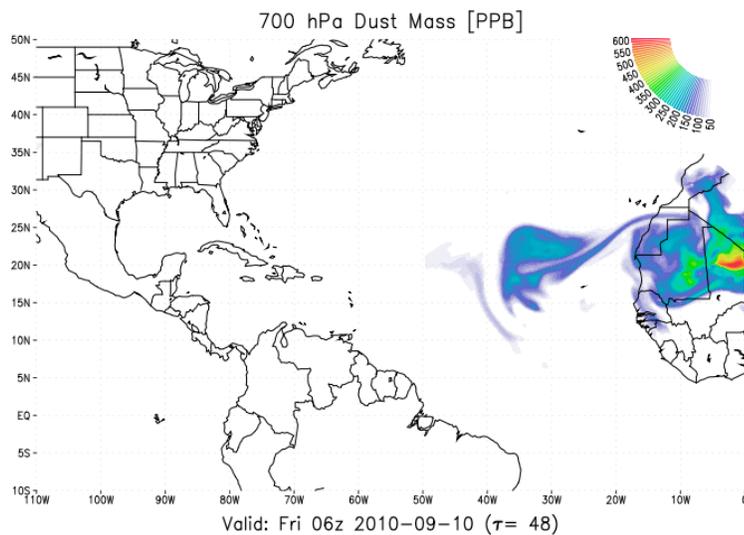
D2



D3



D4



D5

